

CLAIMS

1. Two-dimensional ionising particle detector comprising a matrix of detecting fibres, each detecting fibre forming a pixel of the detector and including a  
5 scintillator to emit scintillation light, characterised in that each detecting fibre is composed of a glass capillary filled with a liquid scintillator for which the chemical composition is chosen such that the average free path of primary scintillation photons is  
10 negligible compared with the diameter (d) of the capillary.

2. Two-dimensional ionising particle detector according to claim 1, characterised in that the liquid  
15 scintillator is a binary liquid scintillator.

3. Two-dimensional ionising particle detector according to claim 1, characterised in that the liquid scintillator is a ternary liquid scintillator.  
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4. Two-dimensional ionising particle detector according to claim 1 or 2, characterised in that the solvent used in the liquid scintillator is PXE.

25 5. Two-dimensional ionising particle detector according to any one of the previous claims, characterised in that the liquid scintillator contains deuterium.

30 6. Two-dimensional ionising particle detector according to any one of the previous claims,

characterised in that the capillaries have a diameter between 20  $\mu\text{m}$  and 500  $\mu\text{m}$  and a length between 10 and 50 mm, and in that the capillaries matrix has a section approximately equal to 100 x 100 mm<sup>2</sup>.

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7. Two-dimensional ionising particle detector according to any one of the previous claims, characterised in that the capillaries are placed in a vat comprising a first wall (7) fitted with a glass  
10 port transparent at the wavelength of the scintillation light and a second wall (8) located in front of the first wall (7) and made of a mirror reflecting at this wavelength, ionising particles penetrating into the detector through the mirror.

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8. Two-dimensional ionising particle detector according to claim 7, characterised in that the vat comprises a top and bottom walls which comprise elastic  
20 membranes (9, 10) so as to absorb thermal expansion.